

# PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:  
MARK T. SKOOG  
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40281.0001 US/PTA: JUNE 9, 2010  
ATTY IDS US DUE: AUGUST 10, 2010  
D63

SBD PCT

NOTIFICATION OF TRANSMITTAL OF  
THE INTERNATIONAL SEARCH REPORT AND  
THE WRITTEN OPINION OF THE INTERNATIONAL  
SEARCHING AUTHORITY, OR THE DECLARATION  
RESP/WD: July 10, 2010  
90 (PCT Rule 44.1) D63

Applicant's or agent's file reference  
40281.1WO/1 ✓

Date of mailing  
(day/month/year)

**FOR FURTHER ACTION** See paragraphs 1 and 4 below

International application No.  
PCT/US 10/28647

International filing date  
(day/month/year) 25 March 2010 (25.03.2010)

Applicant THE REGENTS OF THE UNIVERSITY OF COLORADO

*Demand due 1/31/2011* 400

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

**Filing of amendments and statement under Article 19:**

The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

**When?** The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

**Where?** Directly to the International Bureau of WIPO, 34 chemin des Colombettes  
1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 8270

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:**

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

**4. Reminders**

Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.

Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, Volume II, National Chapters and the WIPO Internet site.

Name and mailing address of the ISA/US  
Mail Stop PCT, Attn: ISA/US  
Commissioner for Patents  
P.O. Box 1450, Alexandria, Virginia 22313-1450  
Facsimile No. 571-273-3201

Authorized officer:

Lee W. Young

PCT Helpdesk: 571-272-4300  
PCT OSP: 571-272-7774

# PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:  
**MARK T. SKOOG**  
**MERCHANT & GOULD P.C.**  
**P.O.BOX 2903**  
**MINNEAPOLIS, MN 55402-0903**

# PCT

NOTIFICATION OF TRANSMITTAL OF  
 THE INTERNATIONAL SEARCH REPORT AND  
 THE WRITTEN OPINION OF THE INTERNATIONAL  
 SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Date of mailing  
 (day/month/year)

**10 MAY 2010**

Applicant's or agent's file reference  
**40281.1WOI1**

**FOR FURTHER ACTION** See paragraphs 1 and 4 below

International application No.  
**PCT/US 10/28647**

International filing date  
 (day/month/year) **25 March 2010 (25.03.2010)**

Applicant **THE REGENTS OF THE UNIVERSTIY OF COLORADO**

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**Filing of amendments and statement under Article 19:**

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**When?** The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

**Where?** Directly to the International Bureau of WIPO, 34 chemin des Colombettes  
 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 8270

**For more detailed instructions, see the notes on the accompanying sheet.**

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

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☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

**4. Reminders**

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The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.

Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, Volume II, National Chapters and the WIPO Internet site.

Name and mailing address of the ISA/US  
 Mail Stop PCT, Attn: ISA/US  
 Commissioner for Patents  
 P.O. Box 1450, Alexandria, Virginia 22313-1450  
 Facsimile No. 571-273-3201

Authorized officer:

Lee W. Young

PCT Helpdesk: 571-272-4300  
 PCT OSP: 571-272-7774

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 40281.1WOI1	<b>FOR FURTHER ACTION</b> <div style="float: right; font-size: small;">see Form PCT/ISA/220 as well as, where applicable, item 5 below.</div>	
International application No. PCT/US 10/28647	International filing date ( <i>day/month/year</i> ) 25 March 2010 (25.03.2010)	(Earliest) Priority Date ( <i>day/month/year</i> ) 31 March 2009 (31.03.2009)
Applicant THE REGENTS OF THE UNIVERSTIY OF COLORADO		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 2 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of:

☒ the international application in the language in which it was filed.

☐ a translation of the international application into \_\_\_\_\_ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☐ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. \_\_\_\_\_

☐ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☒ none of the figures is to be published with the abstract.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 10/28647

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A61K 6/087, C08F 2/48 (2010.01)

USPC - 523/116

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

USPC -- 523/116, 522/107, 522/11, 522/26, 522/28, 522/30, 522/33, 522/44, 522/47, 522/63, 522/64, 528/360

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WEST -- PGPB,USPT,USOC,EPAB,JPAB; Dialog Classic Files -- 654, 652, 351, 349, 6, 35, 65, 155; Google Scholar; Google Patents; USPTO Web Page; Search terms -- photopolymerization, dental resin, prosthesis, thiol, dimethacrylate monomer, ene, photoinitiator, filler, BPADMA, TATATO, PETMP, shaping

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2007/0082966 A1 (BOWMAN et al.) 12 April 2007 (12.04.2007) para [0002], [0008], [0019], [0021], [0022], [0031], [0034], [0035], [0040], [0057], [0059], Fig 1	1-20
Y	US 2009/0047633 A1 (HUO et al.) 19 February 2009 (19.02.2009) para [0003], [0022], [0032]	1-18
Y	US 6,310,161 B1 (WEISSMAN) 30 October 2001 (30.10.2001) col 15, ln 45-51; col 16, ln 46-57; col 18, ln 9-11, ln 22-25, ln 30-36	19, 20

☐ Further documents are listed in the continuation of Box C.

## \* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&amp;" document member of the same patent family

Date of the actual completion of the international search

27 April 2010 (27.04.2010)

Date of mailing of the international search report

10 MAY 2010

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents  
P.O. Box 1450, Alexandria, Virginia 22313-1450

Facsimile No. 571-273-3201

Authorized officer:

Lee W. Young

PCT Helpdesk: 571-272-4300

PCT OSP: 571-272-7774

# PATENT COOPERATION TREATY

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INTERNATIONAL SEARCHING AUTHORITY

To: MARK T. SKOOG  
MERCHANT & GOULD P.C.  
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MINNEAPOLIS, MN 55402-0903

# PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Date of mailing  
(day/month/year)

**10 MAY 2010**

Applicant's or agent's file reference  
**40281.1WO11**

**FOR FURTHER ACTION**

See paragraph 2 below

International application No.

**PCT/US 10/28647**

International filing date (day/month/year)

**25 March 2010 (25.03.2010)**

Priority date (day/month/year)

**31 March 2009 (31.03.2009)**

International Patent Classification (IPC) or both national classification and IPC

**IPC(8) - A61K 6/087, C08F 2/48 (2010.01)**

**USPC - 523/116**

Applicant **THE REGENTS OF THE UNIVERSTIY OF COLORADO**

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

## 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/US  
Mail Stop PCT, Attn: ISA/US  
Commissioner for Patents  
P.O. Box 1450, Alexandria, Virginia 22313-1450  
Facsimile No. **571-273-3201**

Date of completion of this opinion

**27 April 2010 (27.04.2010)**

Authorized officer:

**Lee W. Young**

PCT Helpdesk: 571-272-4300  
PCT OSP: 571-272-7774

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.  
PCT/US 10/28647

Box No. I      Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:  
☒ the international application in the language in which it was filed.  
☐ a translation of the international application into \_\_\_\_\_ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:
  - a. (means)  
☐ on paper  
☐ in electronic form
  - b. (time)  
☐ in the international application as filed  
☐ together with the international application in electronic form  
☐ subsequently to this Authority for the purposes of search
4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US 10/28647

**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Claims	1-20	YES
	Claims	NONE	NO
Inventive step (IS)	Claims	NONE	YES
	Claims	1-20	NO
Industrial applicability (IA)	Claims	1-20	YES
	Claims	NONE	NO

**2. Citations and explanations:**

Claims 1-18 lack an inventive step under PCT Article 33(3) as being obvious over US 2007/0082966 A1 to Bowman et al (hereinafter "Bowman") in view of US 2009/0047633 A1 to Huo et al. (hereinafter "Huo").

Regarding claim 1, Bowman teaches a photopolymerizable dental restorative composition (para [0002]) wherein the composition comprises, relative to the total weight of all polymerizable monomers: a methacrylate monomer (para [0034], [0040]); and at least about 10% by weight of combined weight of a thiol monomer (para [0008], 10-90% thiol) and an ene monomer (para [0008], [0032], 50:50 thiol:ene); and a photoinitiator (para [0021], [0022], [0055]); wherein the molar ratio of thiol functional groups from the thiol monomer relative to the ene functional groups from the ene monomer is greater than 1:1 (para [0008], [0031], 10-90% thiol with the balance other functional groups including "ene" such as vinyl moieties). Bowman as above teaches the use of methacrylate monomer but does not specifically teach that the amount of methacrylate monomer is at least about 40% by weight of a methacrylate monomer relative to the total weight of all polymerizable monomers. Huo teaches dental restoration compositions (para [0003]) made by photopolymerization (para [0032]) and further comprising the methacrylate monomer, EBPADMA in an amount between 10-60% of the composition (para [0022]). It would have been obvious to one of skill in the art to combine the teachings of Bowman and Huo to add a polymerizable methacrylate monomer in an amount of at least about 40% by weight to a system comprising a thiol-ene monomer combination and photoinitiator for making a dental restorative composition, because the addition of at least 40% methacrylate monomer as taught by Huo would be expected to complement a thiol-ene system having a greater than 1:1 ratio of thiol to ene as taught by Bowman in view of the additional use of methacrylates in dental restorative compositions as taught by Bowman.

Regarding claim 2, further to the composition of claim 1, as described above, Bowman teaches that the molar ratio of the thiol functional groups to the ene functional groups is greater than about 1.5:1 (para [0008], [0031], 10-90% thiol with the balance comprised of vinyl (ene) or other polymerizable monomers).

Regarding claim 3, further to the composition of claim 2, as described above, Bowman teaches that the molar ratio of the thiol functional groups to the ene functional groups is greater than about 1.75:1 (para [0008], [0031], 10-90% thiol with the balance comprised of vinyl (ene) or other polymerizable monomers).

Regarding claim 4, further to the composition of claim 2, as described above, Bowman teaches that the molar ratio of the thiol functional groups to the ene functional groups is greater than about 1.75:1 (para [0008], [0031], 10-90% thiol with the balance comprised of vinyl (ene) or other polymerizable monomers).

Regarding claim 5, further to the composition of claim 1, as described above, Bowman teaches that the photoinitiator (para [0021], [0022], [0055]) is a visible light activated photoinitiator (para [0035], camphorquinone).

Regarding claim 6, further to the composition of claim 5, as described above, Bowman teaches that the photoinitiator (para [0021], [0022], [0055]) is camphorquinone (para [0035]).

Regarding claim 7, further to the composition of claim 1, as described above, Bowman teaches (the composition) further comprising a filler (para [0021], [0035], [0038], [0052]) in an amount of up to 90% by weight (para [0019], [0022], Table 1, when the thiol component is present at 10% of the composition, para [0008]) with respect to the total weight of the filled composition.

Regarding claim 8, further to the composition of claim 7, as described above, Bowman teaches that the filler (para [0021], [0035], [0038], [0052]) is 60 to 85% by weight (para [0052], Table 1, 60%) with respect to the total weight of the filled composition.

SEE CONTINUATION SHEET.

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US 10/28647

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:  
Box V.2 - Citations and explanations

Regarding claim 9, further to the composition of claim 1, as described above, Huo teaches (the composition) comprising 50 to 80% by weight of the methacrylate monomer (para [0022], 10-60% EPBDMA) but does not specifically teach that the composition comprises 20 to 50% by weight of the combined weight of the thiol monomer and the ene monomer. Bowman as above teaches (the composition) having 20 to 50% by weight of the combined weight of the thiol monomer and the ene monomer (para [0008], [0031], 10-90% thiol with the balance other functional groups including "ene" such as vinyl moieties) and including methacrylate monomer (para [034], [0040]). It would have been obvious to one of skill in the art to combine the teachings of Bowman and Huo to add a polymerizable methacrylate monomer in an amount of about 50-80% by weight to a system comprising a thiol-ene monomer combination at 20-50% of the weight of the composition, because the addition of 50-80% methacrylate monomer as taught by Huo would be expected to complement a thiol-ene system having a 20-50% thiol-ene content as taught by Bowman in view of the additional use of methacrylates in dental restorative compositions and the ranges of thiol to other polymerizable monomers as taught by Bowman.

Regarding claim 10, further to the composition of claim 9, as described above, Huo teaches (the composition) comprising 60-70% by weight of the methacrylate monomer (para [0022], 10-60% EPBDMA) but does not specifically teach that the composition comprises 30 to 40% by weight of the combined weight of the thiol monomer and the ene monomer. Bowman as above teaches (the composition) having 30-40% by weight of the combined weight of the thiol monomer and the ene monomer (para [0008], [0031], 10-90% thiol with the balance other functional groups including "ene" such as vinyl moieties) and including methacrylate monomer (para [034], [0040]). It would have been obvious to one of skill in the art to combine the teachings of Bowman and Huo to add a polymerizable methacrylate monomer in an amount of about 60-70% by weight to a system comprising a thiol-ene monomer combination at 30-40% of the weight of the composition, because the addition of 60-70% methacrylate monomer as taught by Huo would have been expected to be extendable to 70% to compensate for lower levels of other monomers and further would be expected to complement a thiol-ene system having a 30-40% thiol-ene content as taught by Bowman in view of the additional use of methacrylates in dental restorative compositions and the ranges of thiol to other polymerizable monomers as taught by Bowman.

Regarding claim 11, further to the composition of claim 1, as described above, Huo teaches that the methacrylate monomer is a dimethacrylate monomer (para [0022]), ethoxylated bisphenol-A dimethacrylate (EBPADMA (para [0022])).

Regarding claim 12, further to the composition of claim 11, as described above, Huo teaches that the methacrylate monomer is ethoxylated bisphenol-A dimethacrylate (EBPADMA) (para [0022]).

Regarding claim 13, further to the composition of claim 1, as described above, Bowman teaches that the thiol monomer (para [0008], [0053]) is pentaerythritol tetramercaptopropionate (PETMP) (para [0032], [0057], [0059], Fig 1).

Regarding claim 14, further to the composition of claim 13, as described above, Bowman teaches that the thiol monomer (para [0008], [0053]) is pentaerythritol tetramercaptopropionate (PETMP) (para [0032], [0057], [0059], Fig 1).

Regarding claim 15, further to the composition of claim 1, as described above, Bowman teaches that the ene monomer (para [0008], [0032]) is Triallyl-1,3,5-triazine-2,4,6-trione (TATATO) (para [0032], [0047], [0052]).

Regarding claim 16, further to the composition of claim 15, as described above, Bowman teaches that the ene monomer (para [0008], [0032]) is Triallyl-1,3,5-triazine-2,4,6-trione (TATATO) (para [0032], [0047], [0052]).

Regarding claim 17, further to the photopolymerizable composition of claim 7, as described above, Bowman teaches a method of preparing a shaped dental prosthetic device for use in a human mouth (para [0019]), the method comprising: dispensing the photopolymerizable composition (para [0019]); shaping the composition into a form of the shaped dental prosthetic device (para [0019]); and photopolymerizing the shaped composition (para [0019]).

Regarding claim 18, further to the method of claim 17, as described above, Bowman teaches that the molar ratio of the thiol functional groups to the ene functional groups is greater than about 1.5:1 (para [0008], [0019], [0031], 10-90% thiol with the balance other functional groups including "ene" such as vinyl moieties).

SEE CONTINUATION SHEET.



**Supplemental Box**

**In case the space in any of the preceding boxes is not sufficient.**

Continuation of:  
Box V.2 - Citations and explanations, supplemental box 1

Claims 19 and 20 lack an inventive step under PCT Article 33(3) as being obvious over Bowman in view of US 6,310,161 B1 (Weissman).

Regarding claim 19, Bowman teaches a photopolymerizable dental restorative composition (para [0002]) wherein the composition comprises, relative to the total weight of all polymerizable monomers: a methacrylate monomer (para [0034], [0040]) and thiol monomers (para [0008], 10-90% thiol). Bowman does not specifically teach that the methacrylate monomer is at least about 50% by weight of the composition or wherein the balance of the polymerizable monomers are thiol monomers. Weissman teaches a photopolymerizable composition (col 15, ln 45-51) comprising methacrylates (col 15, ln 6-39) and thiols which are reactive with the methacrylates (col 18, ln 9-11; col 18, ln 30-36) wherein the methacrylate is present in at least about 50% by weight of the composition (col 18, ln 30-36, 0.5-60%) and further including a photoinitiator (col 16, ln 46-57). It would have been obvious to one of skill in the art to combine the teachings of Bowman and Weissman to provide a photopolymerizable dental restorative composition comprising a binary polymerizable mixture of methacrylate and thiol monomers with the methacrylate monomer comprising least about 50% by weight of the composition and wherein the balance of the polymerizable monomers are thiol monomers, because the binary composition using methacrylate in an amount of at least 50% and thiols for photopolymerization as taught by Weissman would have been expected to allow the formation of a dental restorative composition as taught by Bowman without the necessity of an ene monomer when subjected to photoinitiation as taught by both references.

Regarding claim 20, further to the composition of claim 19, as described above, Weissman teaches that (the composition) further comprising a photoinitiator (col 16, ln 46-57).

Claims 1-20 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

## NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under Article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the *PCT Applicant's Guide*.

In these Notes, "Article," "Rule" and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

### INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report and the written opinion of the International Searching Authority, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only (see *PCT Applicant's Guide*, Annex B).

The attention of the applicant is drawn to the fact that amendments to the claims under Article 19 are not allowed where the International Searching Authority has declared, under Article 17(2), that no international search report would be established (see *PCT Applicant's Guide*, International Phase, paragraph 296).

#### What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Preliminary Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

**When?** Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

#### Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

**How?** Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet or sheets containing a complete set of claims in replacement of all the claims previously filed must be submitted.

Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively in Arabic numerals (Section 205(a)).

**The amendments must be made in the language in which the international application is to be published.**

#### What documents must/may accompany the amendments?

**Letter (Section 205(b)):**

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

**The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.**

## **SEQUENCE LISTINGS AND TABLES RELATED THERETO IN INTERNATIONAL APPLICATIONS FILED IN THE U.S. RECEIVING OFFICE**

The Administrative Instructions (AIs) under the Patent Cooperation Treaty (PCT), in force as of **July 1, 2009**, contain important changes relating to the manner of filing, and applicable fees for, sequence listings and/or tables related thereto (sequence-related tables) in international applications. The complete text may be accessed at <http://www.wipo.int/pct/en/texts/index.htm>.

Effective **July 1, 2009**, Part 8 and Annex C-*bis* will no longer form part of the AIs. Part 8 was introduced in 2001 as a temporary solution to problems arising from the filing of very large sequence listings on paper and provided for a *sequence listing forming part of the international application* to be filed in electronic form on physical medium (e.g., CD), together with the remainder of the application on paper. In 2002, Part 8 was expanded to include sequence-related tables and Annex C-*bis* was added to provide technical requirements. All applicants may now file complete international applications in electronic form, eliminating the need for these temporary provisions.

### **I. AIs PART 8 AND ANNEX C-BIS DELETED AS OF JULY 1, 2009**

- A) **Sequence-related tables cannot be filed as a separate part of the description or in text format.** They must be provided as an integral part of the international application either:
- in PDF format as part of an international application filed in electronic form via EFS-Web; or
  - on paper as part of an international application filed on paper.
- B) **A *sequence listing forming part of an international application* may be provided either:**
- in electronic form, as part of an international application filed in electronic form via EFS-Web, in
    - Annex C/ST.25 text format (preferred), or
    - PDF format; or
  - on paper as part of an international application filed on paper.
- C) **A *sequence listing not forming part of the international application* (for search under PCT Rule 13ter) in Annex C/ST.25 text format**
- is not required where the *sequence listing forming part of the international application* was filed in Annex C/ST.25 text format as part of an international application filed in electronic form via EFS-Web
  - is required for search where the *sequence listing forming part of the international application* was filed in PDF
  - is required for search on physical medium (e.g., CD) where the *sequence listing forming part of the international application* was filed on paper as part of an international application filed on paper.

### **II. CALCULATION OF THE INTERNATIONAL FILING FEE AND FEE REDUCTION UNDER AI § 707**

- A) **A sequence-related table must form an integral part of the international application and will incur FULL page fees with no upper limit.**
- B) **A *sequence listing forming part of an international application* filed:**
- via EFS-Web in Annex C/ST.25 text format will incur NO page fees;
  - on paper or in PDF format will incur FULL page fees with no upper limit.

### **III. AVAILABILITY OF SEQUENCE LISTINGS SUBMITTED FOR SEARCH UNDER PCT RULE 13TER**

International Searching Authorities will be required to transmit to the International Bureau a copy of an Annex C/ST.25 text format sequence listing provided for search under PCT Rule 13ter. Any such sequence listing will be made available on PATENTSCOPE® (*sequence listings forming part of the international application* are already available).

### **IV. JULY 2009 REQUEST (PCT/RO/101)**

The Request now has two options for the last sheet: one for paper filings; and one for EFS-Web filings. The July 2009 Request may be accessed at <http://www.wipo.int/pct/en/forms/index.htm>.